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㉒ Size-reducible sheet.

㉓ A print medium sheet having a main portion (10a) and trailing and leading end portions (10c,10b) is sized so that the main portion is sufficiently large to receive a printed image (40) from a printer. The end portions are separated from the main portion by perforations (12,14). During printing, the end portions are not printable. When printing is completed, the end portions (10b,10c) are separated from the main portion (10a). The sheet consisting of the main portion (10a) is smaller than when the end portions were attached and is covered by a larger image than would be possible without printing with the end portions.

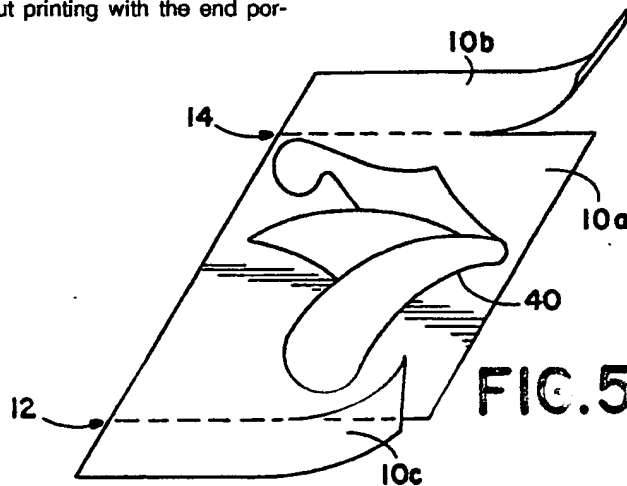


FIG. 5

EP 0 355 422 A2

SIZE-REDUCIBLE SHEET

Field of the Invention

This invention relates to a sheet having portions that are separable, and a method for printing an image on a portion of such a sheet which is larger than the image a printer would be able to print on a sheet the size of the image portion alone.

Background and Summary of the Invention

Almost any printer which prints on precut print medium sheets prints images which are less than the full area of a face of the sheet. This is because the printer must control the travel of the sheet during printing. This is accomplished by using apparatus which may variously grasp the paper and transport it or feed it through pinch rollers which move the paper. Since printing, particularly high quality graphics printing, cannot be satisfactorily achieved on the uncontrolled ends of the sheets, the leading and trailing margins of the sheets are not printed. These margins are used to secure the sheet during printing.

For instance, a thermal printer having model number 4693 made by Tektronix of Beaverton, Oregon prints in an area 8.13 inches wide by 10.66 inches long on an 8.5 inch by 14 inch legal size paper. On an A size paper, such as 8.5 inch by 11 inch, the printable area is 8.11 inches wide by 8.31 inches long. The side margins are each less than 0.2 inches. However, the ends which form the leading and trailing edges of the paper sheet have respective margins of more than 1.5 inches. This printer can print an image having a maximum length of about 10.5 inches. In order to fully utilize the image area for which the printer is capable, the printing sheet must be about 14 inches long. For certain applications, such as when letter (A) size paper is used for the other sheets with which the printed image will be associated, this length is too long for convenient handling and storage.

A continuous fanfold type of computer printer paper is known which has perforated side margins having holes for engaging by a tractor drive system. This paper, however, is continuous, with a multiple of pages connected at perforated top and bottom edges. In many commercial environments, this paper is considered informal and cannot be fed into the printer one page at a time. It is also not practical for single sheet production of high quality graphic images. Also, many printers will only accept single sheets. Thus, where single sheet printing is required, such paper cannot be used.

The present invention overcomes this disadvantage of the conventional printing sheets by providing a sheet, and method for using the sheet, which allows the full image to be printed while producing a sheet of smaller and more convenient size.

More particularly, the present invention provides a print medium sheet for use in a printer which transports the sheet along a travel path and which prints an image on the sheet such that at least one of the leading and trailing edges has a first predetermined area which is not printed. The sheet comprises a main portion having a second predetermined area corresponding to an area of an image printable by the printer and having leading and trailing edges. A first marginal sheet portion has a third predetermined area corresponding to at least a portion of the first predetermined area. Finally, means are provided for joining an edge of the marginal portion to the one of the leading and trailing edges of the main portion in a manner forming a combined sheet formed of the two portions. This joint provides for the two portions to be separated manually along the common edges. Thus, the main portion, when separated from the marginal portion, forms a final sheet having a printed image larger than the image which would be printable on the main portion alone.

The present invention also provides a method of printing an image on a main print medium sheet with a printer which prints an image on a sheet such that at least one of the leading and trailing edges has a predetermined area which is not printed. The printed area of the image is larger than the area of the main sheet reduced by the predetermined area. The method comprises providing an oversized sheet having an area corresponding to the combined area of the main sheet and the predetermined area. A joint is formed between the main sheet and the predetermined area providing for manual separation. The image is printed on the oversized sheet in the area of the main sheet. The portion of the at least one of the leading and trailing edges which has not been printed is separated along the joint from the main portion.

In the preferred form of a print medium sheet made according to the invention, an oversized sheet is provided having trailing and leading margins which correspond to the sizes of the unprinted margins. These margins are joined to a main sheet portion sized to have the image printed thereon. The margins are then separable from the main portion by tearing along perforations separating the margins from the main portion.

It will be seen that the present invention pro-

vid s th conv ni nce of a print medium sheet which is big enough to allow printing of a desired imag thereon. Further, once printing is complete, the unprinted leading and trailing margins are removable from the main portion having the printed image. The main portion has a reduced size which is more convenient for handling, and can be made to conform to a standard size.

These and other features and advantages of the present invention will become apparent from a reading of the following detailed description of the preferred embodiment in conjunction with the accompanying drawings.

Brief Description of the Drawings

Fig. 1 is an isometric view of a print medium sheet made according to the invention.

Figs. 2-4 are simplified illustrations showing printing an image on the sheet of Fig. 1.

Fig. 5 is an isometric view showing the beginning of removal of the leading and trailing margins of the sheet of Fig. 1 after printing.

Fig. 6 is an isometric view showing the main portion of the sheet of Fig. 5 after the end margins have been removed.

Detailed Description of the Preferred Embodiment

Referring initially to Fig. 1 a print medium sheet 10, also referred to as an oversized sheet, made according to the present invention is shown. Sheet 10 includes a main portion 10a, and end portions 10b and 10c. In this embodiment, where approximately the top and bottom 1.5 inches are not printed by the printer used, the two end portions are each 1.5 inches long. Where the largest printable image is about 10.5 inches long, the length of sheet 10 is 14 inches to allow about 0.25 inches of unprinted margin on the top and bottom.

The end portions are joined to the main portion at joints shown generally at 12 and 14. As will be seen, these end portions are removed from the main portion by tearing along perforations formed in oversized sheet 10. These perforations form the joint between the respective portions.

Figs. 2-4 illustrate the handling of sheet 10 during printing. One end of the sheet is fed between a pair of feed rollers 16 of a printer 18. Since both end portions 10b and 10c are of the same length, the sheet may be fed with either end first. Whichever end is fed in first then becomes the leading end, shown generally at 20. The other end, shown generally at 22, is the trailing end. If there was a difference in the amount of unprinted area on the leading and trailing ends of sheet 10, then end portions 10b and 10c could be made to

have different lengths, and therefore areas, to correspond to this. However, it would also be necessary to feed in the leading edge first each time.

The input sheet passes through guides 24 and is wrapped around a platen 26 until the leading edge is grasped by a clamp 28. Clamp 28 is attached to a drum 30. A thermal print head 32 is disposed opposite platen 26. A print ribbon 34 extends between takeup rollers 35 and 36, and through the region 38 between the print head and platen where printing takes place.

During printing, sheet 10 is pulled through region 38, with the printed and leading portions of the sheet supported on drum 30, as shown in Fig. 3. After printing is completed, the sheet is returned along the sheet travel path in the reverse sequence that it was inserted and printed. This is illustrated by Fig. 4.

It can be seen in viewing Figs. 2-4 that a significant portion of the ends of sheet 10 are not printed. The joints 12 and 14 thus correspond to the separation of the printed and nonprinted portions.

After sheet 10 is removed from printer 18, end margins 10b and 10c are removed. Fig. 5 illustrates the beginning of removing of both of these portions from main portion 10a which has an image 40 printed on it. Fig. 6 shows main portion 10a remaining after the end portions have been separated. The prior location of the end portions is shown in phantom lines.

When the sheet is manually held, with a main portion in one hand and an end portion in the other hand, the perforated joint, being weaker than the main portion, tears. Otherwise, tears would result in the main portion. By making the entire sheet 10 out of the same sheet of material, the end portions will also have the strength of the main portion, assuring that tearing is along joints 12 and 14.

Variations in sheet 10 are possible. The main and end portions can be made of different materials. In some applications only one removable end margin may be required. Further, different forms of joints may be used, such as making the end and main portions out of separate pieces of material and linking them together temporarily, such as with adhesive tape. Thus, while the sheet and method of printing with the sheet have been described with reference to the foregoing preferred embodiments, variations in the detail and design may be made without parting from the spirit and scope of the invention as defined in the claims.

Claims

1. A method of printing on a sheet of material by a printer which transports the sheet along a travel

path and which prints an image on the sheet such that at least one of the leading and trailing edges (20,22) has a first predetermined area which is not printed, **characterized by:**

a main portion (10a) having a second predetermined area corresponding to an area of an image printable by the printer;

a first marginal portion (10b,10c) having a third predetermined area corresponding to at least a portion of said first predetermined area; and

means for joining an edge of said marginal portion (10b,10c) to said one of the leading and trailing edges of said main portion (10a) in a manner forming a combined sheet formed of said two portions, and providing for said two portions to be separated manually along the common edges (12,14), so that said main portion, when separated from said marginal portion, forms a final sheet having a printed image larger than the image which would be printable on said main portion alone.

2 A print medium sheet according to claim 1, **characterized** in that both the leading and trailing edges (20,22) of a sheet printable by the printer have predetermined areas (10b,10c) which are not printed, in that said sheet further comprises a second marginal portion (10c,10b) corresponding to the predetermined nonprinted area of the other of the leading and trailing edges, and in that said joining means for joining said second marginal portion along said other of said leading and trailing edges of said main portion is the same as said joining means for joining said first marginal portion.

3 A print medium sheet according to claim 1, **characterized** in that said portions (10a,10b,10c) are formed of a single sheet and said joining means comprises perforations (12,14) extending into said single sheet along the joined edges of said portions.

4 A print medium sheet as claimed in one of claims 1 to 3, **characterized** in that said sheet is an oversized sheet having leading and trailing margins (20,22) each of which has an area (10b, 10c) of at least a portion of the corresponding predetermined areas, and a main portion (10a) between the leading and trailing margins having an area corresponding to a predetermined image area; and perforations (12,14) extend into said oversized sheet between each of said leading and trailing margins and said main portion, whereby said main portion (10a) is separable from said margins by manually tearing along said perforations.

5. A method of printing an image on a main print medium sheet (10) with a printer (18) which prints an image (40) on a sheet such that at least one of the leading and trailing edges has a predetermined area which is not printed, the method comprising: printing the image (40) on the sheet with the printed area of the image being larger than the area of the main sheet reduced by the pre-

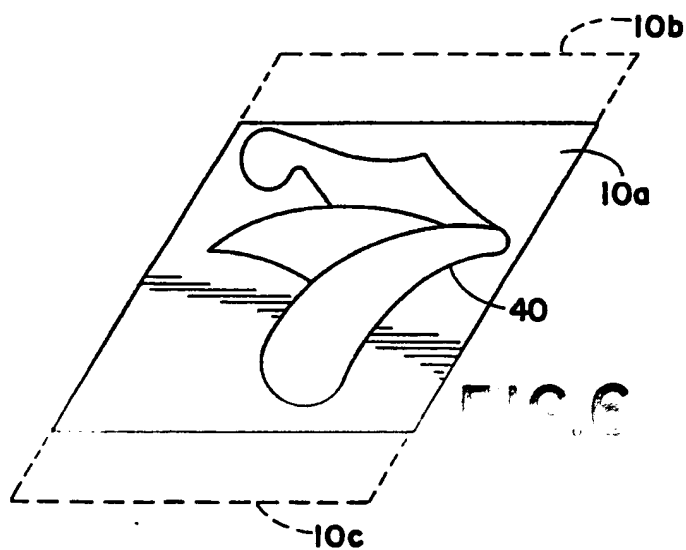
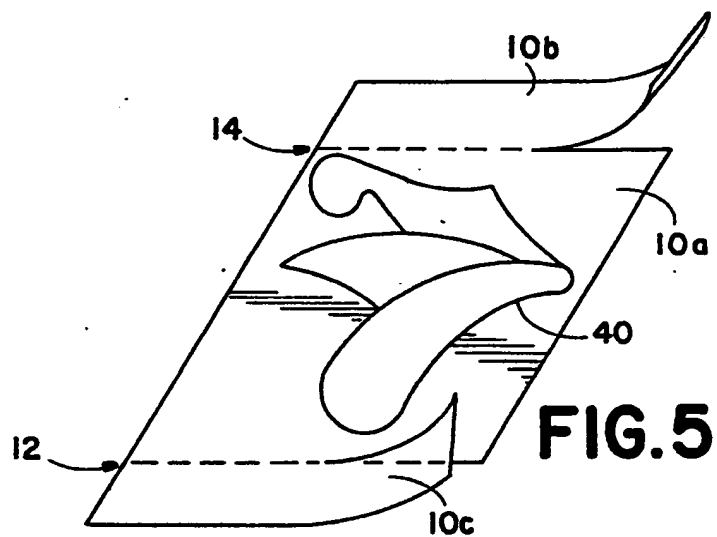
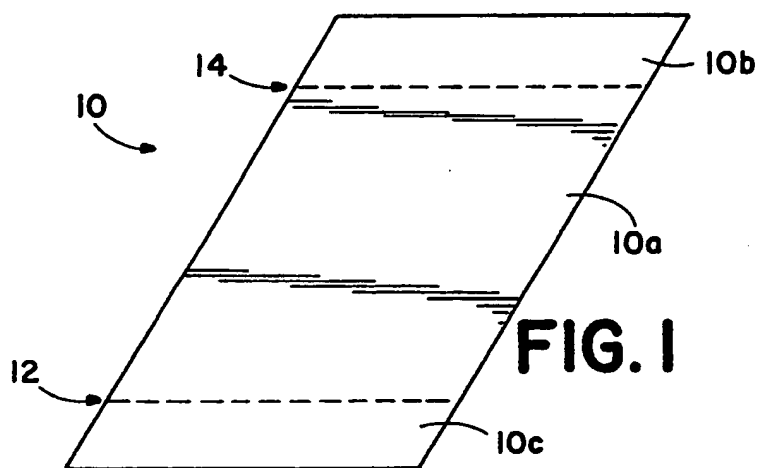
determined area, **characterized by**

providing an oversized sheet (10) having an area corresponding to the combined area of the main sheet and the predetermined area;

forming a joint (12,14) between the main sheet and the predetermined area providing for manual separation; printing the image (40) on the oversized sheet in an area (10a) corresponding to the area of the main sheet whereby the sheet end (10b,10c) of the predetermined area is not printed; and manually separating the sheet end of the predetermined area (10b, 10c) from the main portion (10a) along the joint (12,14).

6. A method according to claim 5, **characterized** in that said forming further comprises perforating the oversized sheet along a line (12,14) separating the main sheet from the at least one of the leading and trailing edges, and said separating further comprises tearing the oversized sheet along the perforations.

7. A method according to claim 6, **characterized** in that said printing further comprises feeding the oversized sheet (10) into the printer (18) so that the sheet end of the predetermined area corresponds to the at least one of the leading and trailing edges which is not printed.



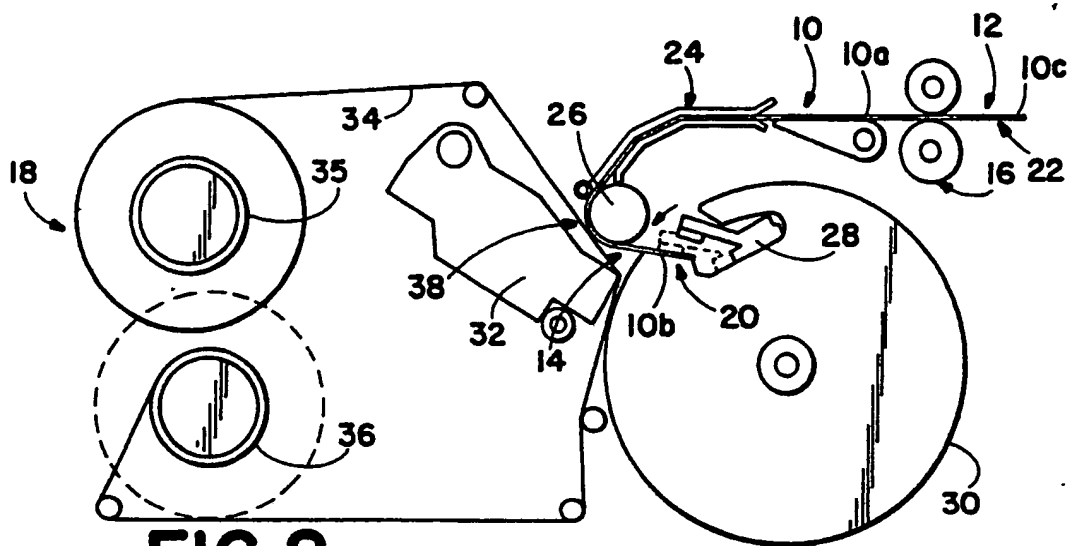


FIG. 2

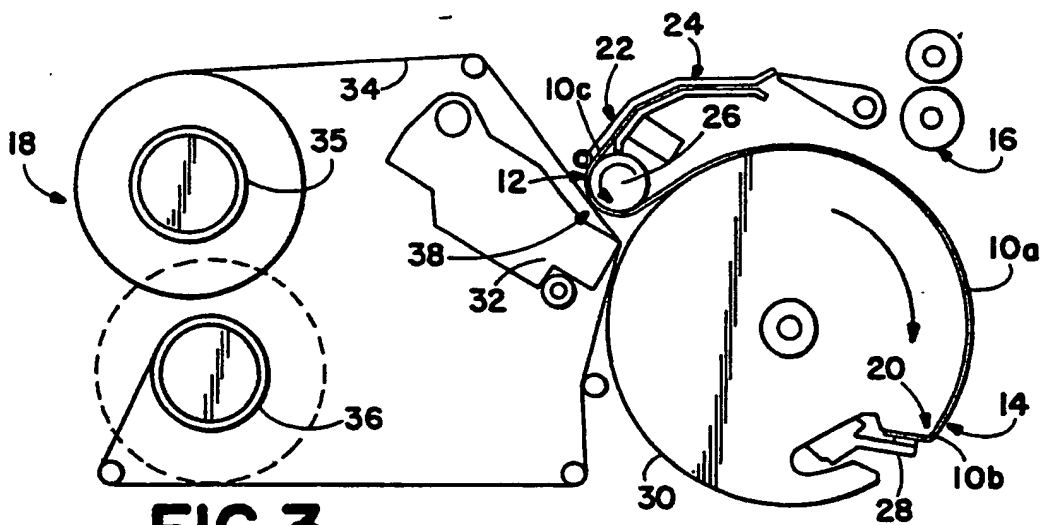


FIG. 3

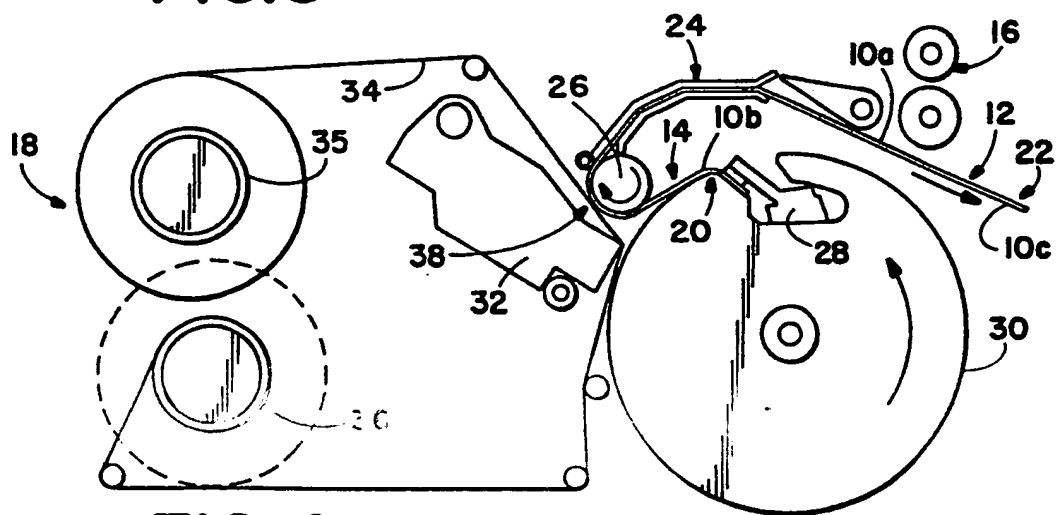


FIG. 4